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AUTHOR Harnish, Dorothy; Anukam, Ray
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ABSTRACT

The business and industry representatives present at the initial meeting of each of Georgia's 16 state technical committees responsible for reviewing the curricula offered by Georgia technical institutes were surveyed to gather information about general trends in the workplace and ways of relating those trends to planning/revising technical education in Georgia (93 responded). The survey focused on the following topics: business-education partnerships; company-sponsored employee training; current business/industry trends (total quality management, hiring qualifications, technical institute program quality, hiring shortage/job growth); and work force issues. One-third of the companies represented were presently members of tech prep or school-to-work partnerships with high schools or technical institutes. Employee training was being provided by 86% of the companies. The quality of programs at technical institutes was considered excellent by 19% of respondents, good by 48%, adequate by 23%, and poor by only 3%. The greatest areas of protected job growth in the next 5-10 years were in the categories technicians (66%), professional positions (25%), and entry-level production jobs (19%). Thirty-four percent of respondents expected downsizing of their companies in the near future. (Appendixes constituting more than 80% of this document contain 41 tables/graphs summarizing the survey results. Contains 10 references.) (MN)

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Research Brief

Georgia Department of Technical and Adult Education
Division of Educational Support Services

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Survey of Georgia Employers

Responsiveness to business and industry needs for an educated workforce has been a hallmark of the technical institutes (TIs) in Georgia since their inception. Program standards and guides for over 120 technical curricula were originally developed through an industry-driven model utilizing input from State Technical Committees of business and industry representatives, working together with TI program faculty. The Standards Project (now the Occupational Research Group) of the University of Georgia and the Georgia Department of Technical and Adult Education (DTAE) provided leadership for this statewide curriculum effort.

Beginning Fall 1995 all standardized programs are undergoing a comprehensive updating process, again based on input from representatives of business and industry from across the state. This statewide industry-driven revision process is focused on issues that define a changing workforce: emerging technologies, the reorganization of work and jobs, and the need for high-level skills as well as basic competencies and productive work attitudes. As a first step of the curriculum revision process, State Technical Committee members were asked to discuss with program developers their perceptions of industry's education and training requirements for hiring qualified workers. Discussion focused on the following questions:

* How is the workforce changing?
* What does industry need from education now and in the future?
* What are the implications of workforce changes for postsecondary technical education curricula and the preparation of students for a changing workplace?
* How well are the TI programs meeting the needs of business and industry in Georgia and preparing students with appropriate job skills?
* What needs to change?

To gather information about general trends in the workplace and how these might be related to program planning and revisions in technical education in Georgia, an employer survey questionnaire was developed for use with DTAE's comprehensive revision process.

Methodology

The survey, designed and administered by the Occupational Research Group (ORG) at the University of Georgia, queried members of the State Technical Committees (STCs) for each of the program areas being reviewed during the first year of DTAE's three year comprehensive revision process. Questionnaire items were drawn from national literature on workforce development, and addressed topics of business/education partnerships, employee training needs, current business/industry trends, and changing workforce issues identified in recent national reports. The survey was administered by ORG to all business and industry representatives at the initial meeting of each of the 16 State Technical Committees in September 1995. Members were asked to complete the questionnaire at the meeting and return it to the ORG program specialist facilitating the meeting. Data was compiled by ORG staff, using SPSS and Excel software to generate descriptive statistics (percent and frequency of responses) and tables and charts illustrating responses to each item on the survey instrument.

Survey Population

A total of 93 completed surveys were received. Representatives from business and industry in the following program areas participated in the survey research: Accounting, Air Conditioning, Automated Manufacturing, Business/Information Technology, Business Equipment, Computers, Drafting, Electronics, Industrial Electrical, Industrial Maintenance, Machine Tool, Marketing, Telecommunications, and Engineering Technologies - Civil, Environmental, Electronic, Mechanical, Electromechanical. The types of companies STC members represented were primarily manufacturing/ industrial and engineering/design (59%), with smaller numbers from general business, public service, and

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communications sectors (9-11% each). More than half (58%) worked at large companies of more than 200 full-time employees, and 15% at companies of 20-100 full-time employees. Nearly all companies were American-owned (96%). Half of the companies were located in urban areas and another third in rural areas of Georgia.

Findings and Discussion

The major categories of response from the survey are summarized and presented in the section which follows. Detailed, descriptive data for each of the questionnaire items are provided in the appendix of this report.

BUSINESS/EDUCATION PARTNERSHIPS:
Respondents were asked to provide information about current partnerships their company participated in with education and areas where they might have an interest in future involvement. One-third of the companies represented were presently members of Tech Prep or School-to-Work partnerships with high schools or technical institutes in Georgia, half were not, and the others were not sure. For those who had partnerships, the types of activities with technical institutes in which company employees most often participated included representation on local advisory committees for TI programs (73%), site tours for TI students or faculty (56%), curriculum development for TI courses (53%), and classroom presentations at local TIS (43%). Where companies were not currently involved with TI activities, they expressed the strongest interest in pursuing work-based learning projects for students and serving as mentors for at-risk students. Nearly half of respondents' companies currently offered tuition assistance for employees taking TI courses, and a third sponsored co-op or internship programs for students. Future interest was expressed most strongly in company sponsorship of summer internships for TI students (37%), as well as internships, job shadowing, and youth apprenticeships where these were not currently available.

COMPANY-SPONSORED EMPLOYEE TRAINING:
Asked about opportunities for employee skill upgrading at their company, 86% of respondents stated that their company provided these opportunities. Areas of employee training provided most frequently by the company included use of computers or other new equipment (73%), teamwork and problem solving (56%), safe use of equipment/tools (47%), and statistical process control or other new processes (41%). This training for employees was provided most often by a hired consultant (58%), a local TI (45%), or a continuing education unit of a local college (31%).

CURRENT BUSINESS/INDUSTRY TRENDS:
Total Quality Management: One area of change in many corporate settings today is the incorporation of quality elements into standard practice. More than half of respondents indicated that the following areas have become or are becoming standard practice in their company: cross-training (70%), employee teams (63%), employee empowerment (60%), and continuous improvement processes (55%).

Hiring Qualifications: Another area of interest was the qualifications considered most important in hiring workers in business and industry. Asked to rank seven *basic skill qualifications*, respondents most frequently chose interpersonal skills as their *highest* priority, followed by problem solving skills, critical thinking skills, and math/computation skills. *Lowest* ranked qualifications (relative to others in the list) were presentation abilities, writing skills, and computer expertise. Asked to rank eight *technical/workplace qualifications*, respondents most frequently chose technical expertise as their *highest* priority, followed closely by education in the appropriate field, job-related experience, and positive work attitudes. *Lowest* ranked qualifications (relative to others on the list) were leadership qualities, adaptability, ability to follow directions, and good work habits.

TI Program Quality: Respondents were asked to rate the quality of programs at the technical institutes on the basis of their experience in hiring TI graduates. Overall responses were positive, with 19% rating programs as excellent, 48% rating them good, and 23% rating them adequate. Only 3% said they were inadequate or poor.

Hiring Shortage/Job Growth: Asked if they were experiencing difficulties or shortages in finding potential employees in any areas, 46% of respondents answered yes, and the same percentage said no. For those who responded in the positive, no clear patterns were identified in specific areas of hiring difficulty or in reasons to account for the shortages (see listing in appendix). The greatest area of job growth in the next 5-10 years predicted by respondents was clearly in the category of technicians (66%). Smaller percents identified growth in professional (25%) and entry-level production (19%) jobs. Very few saw any growth in clerical and management jobs in the near future. Thirty-four percent of respondents expected to see a downsizing in their company in the future, mostly in management areas.

WORKFORCE ISSUES:
Respondents were asked to indicate to what extent their company was experiencing various trends identified in the national literature on the changing nature of the workforce.

Based on the percentages of respondents who said it was *very descriptive* of their company, the following workforce trends seem to be occurring in Georgia business and industry: new technology has increased job skill requirements (58%); employees perform a broad range of tasks including operating and maintaining their own equipment and performing quality control (47%); good attitudes, communication skills, and previous successful work history are more important than academic credentials (38%), and work is performed by self-directed teams (33%). In addition, approximately half of the respondents said the following trends were *somewhat descriptive* of their company: employees participate in goal setting and budgeting activities, collaboration among autonomous teams of workers has replaced chain-of-command management, and responsibility is vested in individuals with specialized skills (horizontal structures). The areas seen as least descriptive of Georgia business/ industry, based on the percentage of respondents who said it was *not at all descriptive* of their company were telecommuting used as an option for some employees (59%), full-time positions being replaced with part-time and temporary employees (54%), mass production being replaced with customized manufacturing (39%), and bachelor degrees being replaced by technical training or associate degrees (38%).

National Surveys of Employers

At the national level, a number of reports and books have appeared recently which examine the changing nature of the workplace and what employers in business and industry expect from education in response to these workforce changes. Anthony Carnivale (1989) states in Workplace Basics: The Skills Employers Want, "New technology. Participative management. Sophisticated statistical quality controls. Customer service. Just-in-time production. The workplace is changing and so are the skills that employees must have in order to change with it. But many do not have the basics essential for acquiring more sophisticated technical skills (p.ii). These basic skills are identified as knowing how to learn, communications, adaptability, personal management, group effectiveness, and leadership, as well as the academic basic skills. He goes on to link basic skills to global competitiveness, technical change, and individual opportunity, stating that "How a country responds to economic and technical change - whether its response will be strong or weak - depends on how the country integrates learning within its employer institutions" (p.6). Other publications by Carnivale, The Learning Enterprise (1989), Training the Technical Workforce (1990), expand on these themes.

The 1991 SCANS Report What Work Requires of Schools looked closely at the changing workplace and the skills needed for employment. It identified five competencies and a three-part foundation of skills and personal qualities that lie at the heart of job performance. Likewise, work currently in progress with national committees and boards to identify industry-specific national voluntary skill standards is another reflection of the national concern with developing a quality workforce education system.

The most recent nationwide survey of employers was conducted by the National Center on the Educational Quality of the Workforce (EQW) in 1994. Called The EQW National Employer Survey, the study examines responses from over 4,000 companies, based on phone interviews with managers in both manufacturing and non-manufacturing sectors. The survey provides information about how employers recruit workers, how they organize work, which educational credentials and experience they use in screening applicants, and what role education and training play in providing a skilled workforce. Some of the key findings include:

* Restructuring of the American Economy has not led to deskilling of work; 56% of employers reported increasing skill requirements.
* Use of high-performance work systems still remains the exception rather than the rule; only 37% reported adopting a formal TQM program, only 12% of non-managerial workers participate in self-managed teams, however, 54% do participate in regular meetings to discuss work-related problems.
* Virtually all employers provide either formal or informal (on-the-job) training for workers, and over half have increased formal training in the past 3 years.
* 20% of current workers were seen as not fully proficient in their jobs because they lacked necessaary skills or because the skill requirements of the job had increased.
* Years of schooling and skills certificates are used to screen and hire applicants, but not measures of school performance (grades); what is most important to employers is applicant attitudes and communication skills, and a successful history of previous work experience.
* The type of training employers provide for workers most often relates to safe use of equipment or tools. Second ranked training area was improving teamwork efforts or problem solving skills and training in customer service. Third ranked area was use of computers and new equipment.
* Training is most often provided by equipment providers/vendors (50%),

private consultants (36%), PICs or industry associations (34%), technical or vocational schools (33%) or community colleges (30%).

The conclusion of the study's authors is that "despite partnership in some areas, employers and schools do not speak the same language. What is required to end the disconnection between schools and employers is the establishment of more direct and businesslike transactions between the two" (EQW Issues, 1995, pg.7). They recommend that employers need to become more familiar with measures of learning provided by the schools, and schools need to make the measures and schooling itself more relevant to the world of work.

Interpreting and comparing results of various surveys of employer needs for skilled workers is complicated by variations in the sampling processes used, methods of collecting data, question formats, position of respondents, and focus of questions.

Conclusion

The role of schools and colleges in preparing students for the workplace is recognized as one which has direct impact on workforce quality and global competitiveness. As the workforce needs change, the skills and attitudes needed by students to be successful in this changing environment also must change. It is important to create clear and strong lines of communication between education and employers to assure the relevance of technical education programs. Involving business and industry in curriculum development and revision, as DTAE recognizes, is the most effective strategy. Periodically collecting information from employers about changing workforce trends statewide can also provide significant input for updating programs in the technical institutes. The annual survey of Georgia employers conducted by the Occupational Research Group can help to inform educators in the technical institutes about workforce trends and their implications for strengthing technical curricula in Georgia.

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GDTAE Research Briefs are prepared by the Occupational Research Group at the University of Georgia, under contract to the Georgia Department of Technical and Adult Education, to summarize emerging issues in the national literature on postsecondary technical education.

Contributors:

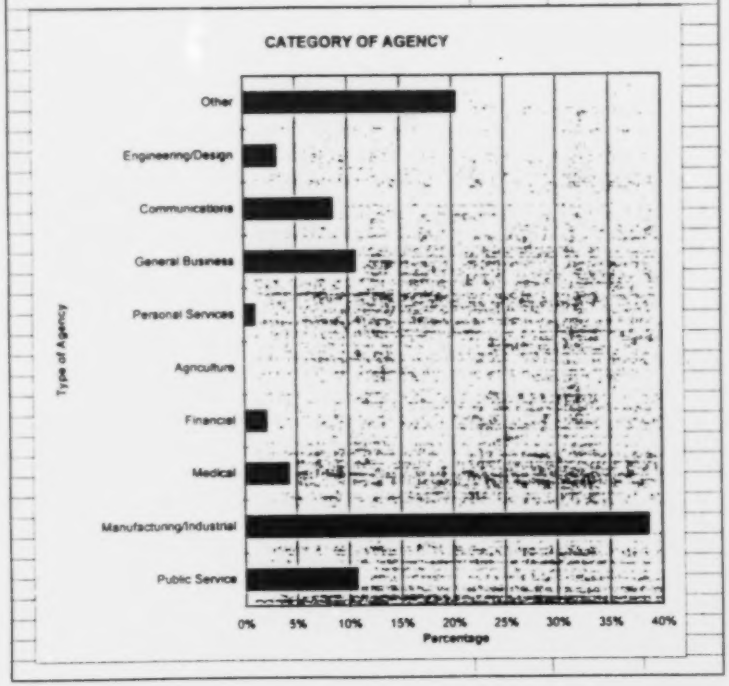
Dr. Dorothy Harnish, Project Coordinator, Occupational Research Group, University of Georgia

Dr. Ray Anukam, Program Specialist, Occupational Research Group, University of Georgia

APPENDIX

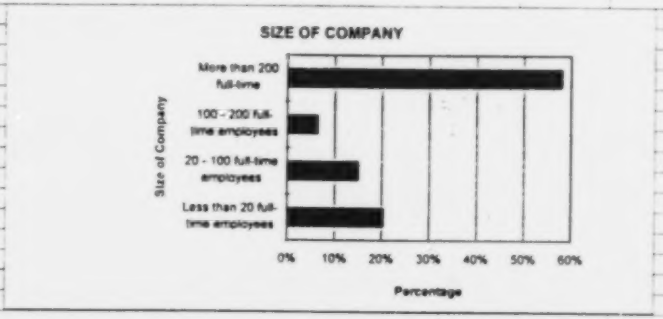
RESPONSES TO EMPLOYER SURVEY
QUESTIONNAIRE ITEMS

COMPANY INFORMATION		
1. Into which of these sectors does your company fall?		
TYPE OF COMPANY	Percent	Frequency
Public Service	11%	10
Manufacturing/Industrial	39%	36
Medical	4%	4
Financial	2%	2
Agriculture	0%	0
Personal Services	1%	1
General Business	11%	10
Communications	9%	8
Engineering/Design	3%	3
Other	20%	19
	100%	93



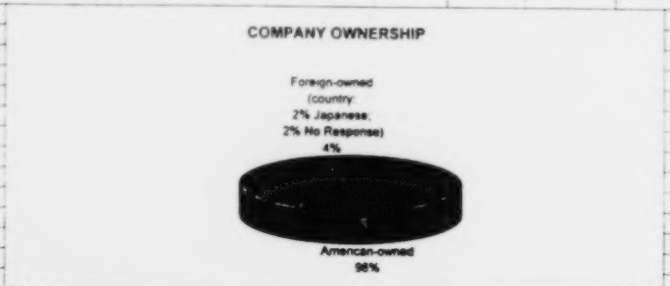
2. What size is your company?

COMPANY SIZE	Percent	Frequency
Less than 20 full-time employees	20%	19
20 - 100 full-time employees	15%	14
100 - 200 full-time employees	6%	6
More than 200 full-time employees	58%	54
	100%	93



3. What is the ownership of your company?

COMPANY OWNERSHIP	Percent	Frequency
American-owned	96%	89
Foreign-owned (country: 2% Japanese; 2% No Response)	4%	4
	100%	93



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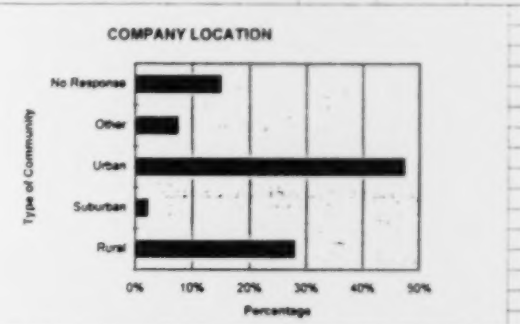
4. In what type of community is your company located?

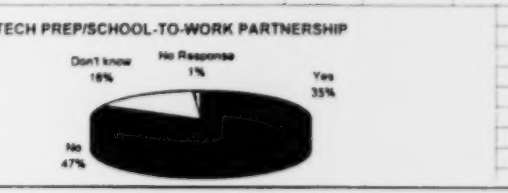
COMPANY LOCATION	Percent	Frequency
Rural	28%	26
Suburban	2%	2
Urban	47%	44
Other	8%	7
No Response	15%	14
	100%	93



BUSINESS/EDUCATION PARTNERSHIPS

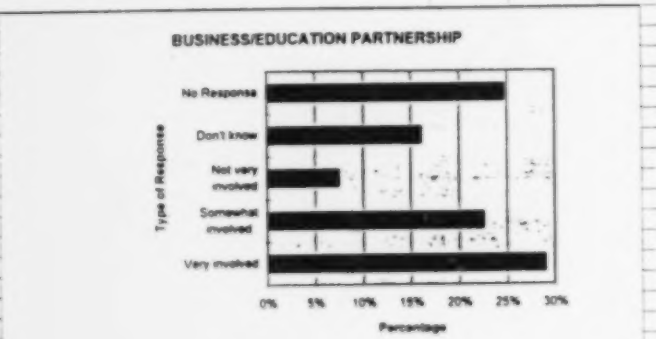
5. Is your company a member of a Tech Prep/School-to-Work Partnership or other Partnership with high schools or technical institutes in Georgia?

TECH PREP/SCHOOL-TO-WORK MEMBERSHIP	Percent	Frequency
Yes	35%	33
No	47%	44
Don't know	16%	15
No Response	1%	1
	100%	93



6. If your company is a member of a business/education partnership, how would you rate the level of involvement?

INVOLVEMENT IN BUS/EDUC PARTNERSHIP	Percent	Frequency
Very involved	29%	27
Somewhat involved	23%	21
Not very involved	8%	7
Don't know	16%	15
No Response	25%	23
	100%	93



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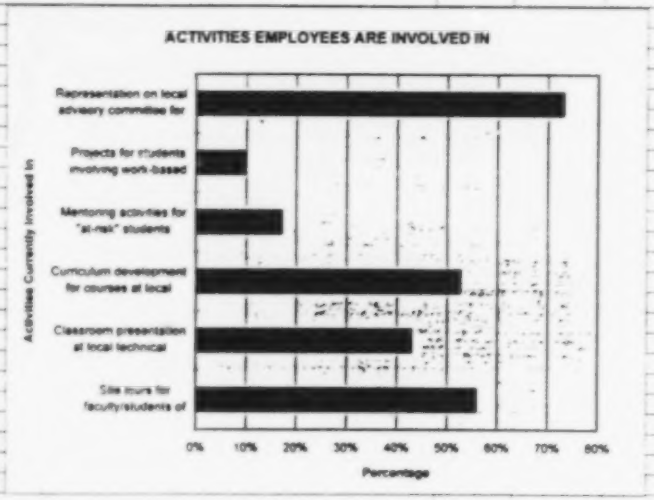
7. Please check the types of activities in which you or other employees in your company currently participate. If you are not currently participating in these activities, check those that you think you would be interested in pursuing.

7.a. Currently Involved

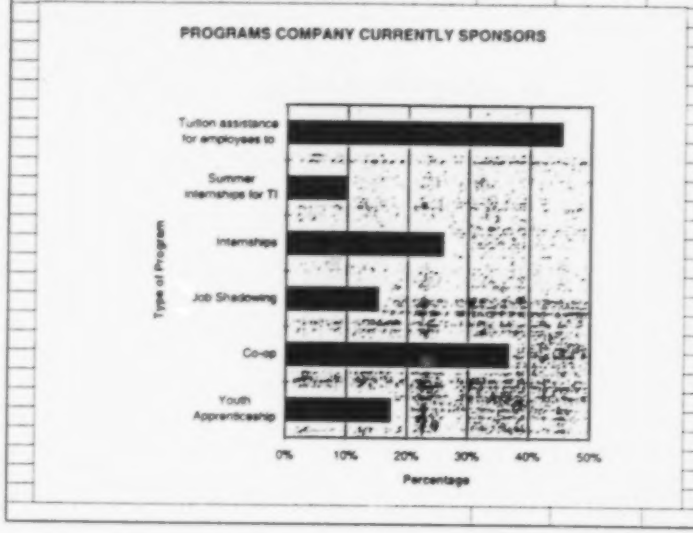
	Percent	Frequency
Site tours for faculty/students of technical institutes	56%	52
Classroom presentation at local technical institutes	43%	40
Curriculum development for courses at local technical institutes	53%	49
Mentoring activities for "at-risk" students	17%	16
Projects for students involving work-based learning	10%	9
Representation on local advisory committee for TI programs	73%	68



8. Please check the types of programs that your company sponsors. If your compnay does not sponsor these types of programs, please check those that you think might interest them.

8.a. Currently Sponsoring

	Percent	Frequency
Youth Apprenticeship	17%	16
Co-op	37%	34
Job Shadowing	15%	14
Internships	26%	24
Summer internships for TI faculty	10%	9
Tuition assistance for employees to take courses at TIs	45%	42



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8.a. Currently Sponsoring		
	Percent	**Frequency**
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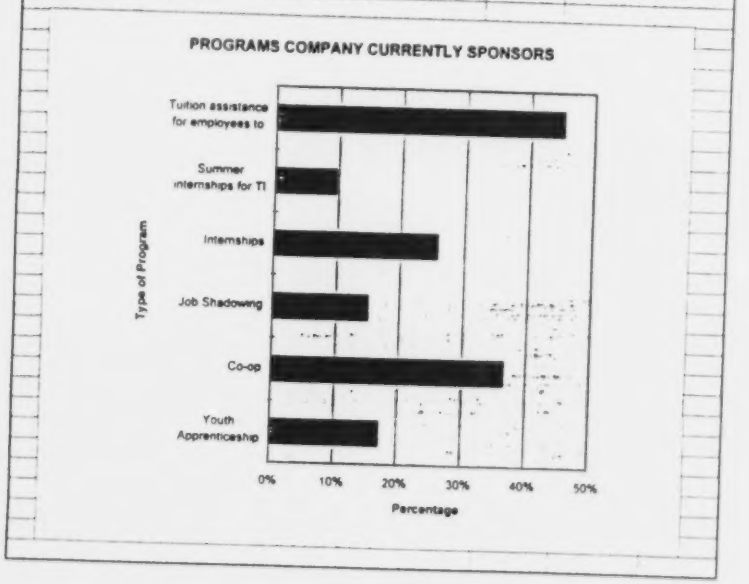

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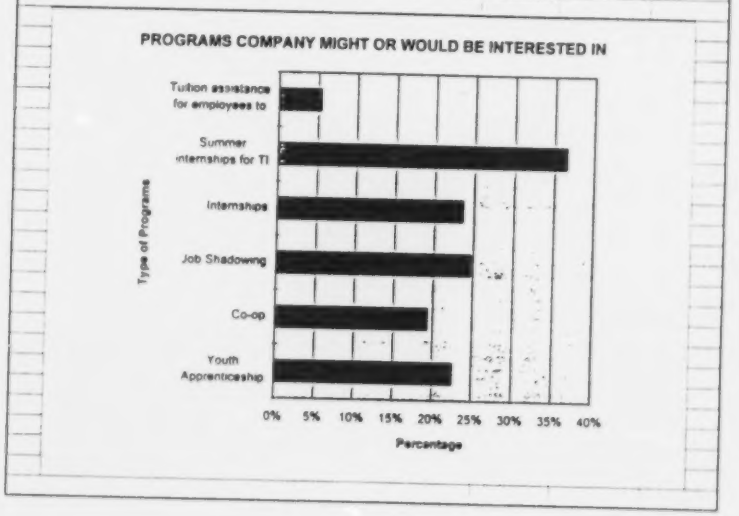
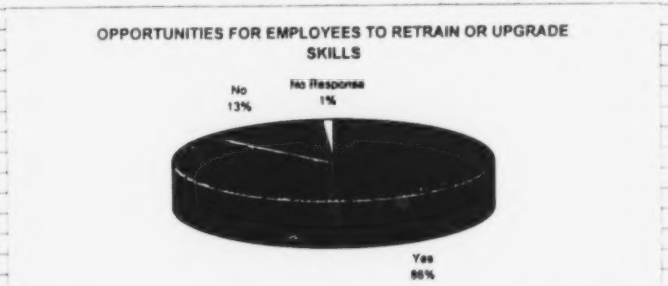
8.b. Might Pursue		
	Percent	**Frequency**
Youth Apprenticeship	23%	21
Co-op	19%	18
Job Shadowing	25%	23
Internships	24%	22
Summer internships for TI faculty	37%	34
Tuition assistance for employees to take courses at TIs	5%	5



EMPLOYEE TRAINING

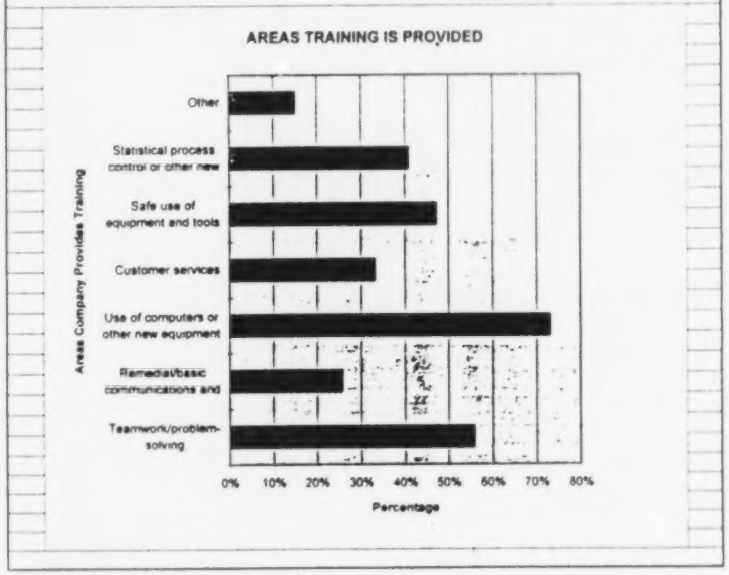
9.a. Does your company provide opportunities for employees to retrain or upgrade skills?

OPPORTUNITIES FOR RETRAINING	Percent	Frequency
Yes	86%	80
No	13%	12
No Response	1%	1
	100%	93



9 b. If you answered "yes," in what areas do you provide training?

AREAS YOU PROVIDE TRAINING	Percent	Frequency
Teamwork/problem-solving	56%	52
Remedial/basic communications and math	26%	24
Use of computers or other new equipment	73%	68
Customer services	33%	31
Safe use of equipment and tools	47%	44
Statistical process control or other new processes	41%	38
Other	15%	14



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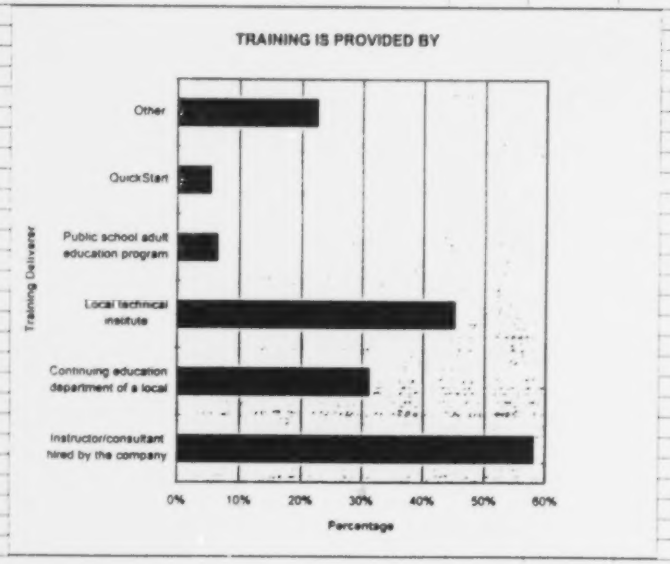
10. Who delivers it?

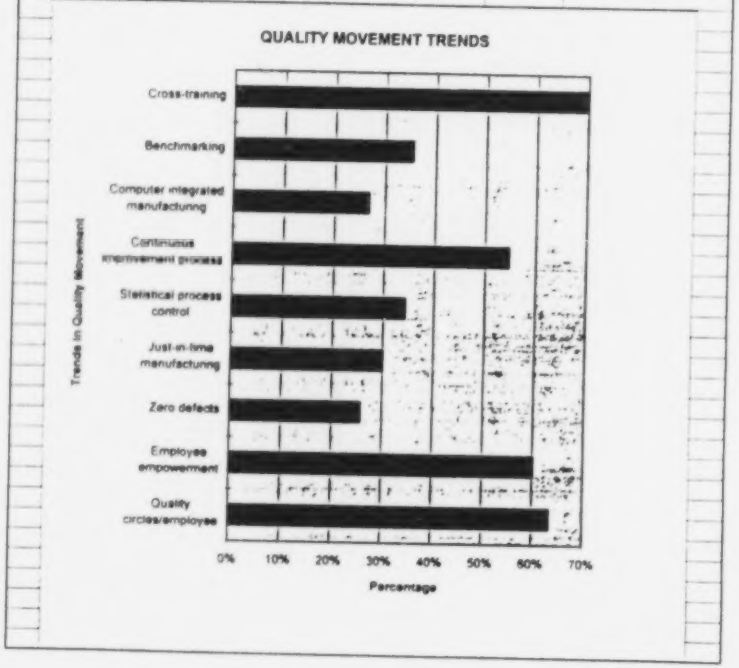
TRAINING DELIVERER	Percent	Frequency
Instructor/consultant hired by the company	58%	54
Continuing education department of a local college	31%	29
Local technical institute	45%	42
Public school adult education program	6%	6
QuickStart	5%	5
Other	23%	21



CURRENT BUSINESS/INDUSTRY TRENDS

11. Please indicate any of the following trends associated with the quality movement that have become or are becoming standard practice in your company.

TRENDS IN QUALITY MOVEMENT	Percent	Frequency
Quality circles/employee teams	63%	59
Employee empowerment	60%	56
Zero defects	26%	24
Just-in-time manufacturing	30%	28
Statistical process control	34%	32
Continuous improvement process	55%	51
Computer integrated manufacturing	27%	25
Benchmarking	35%	33
Cross-training	70%	65



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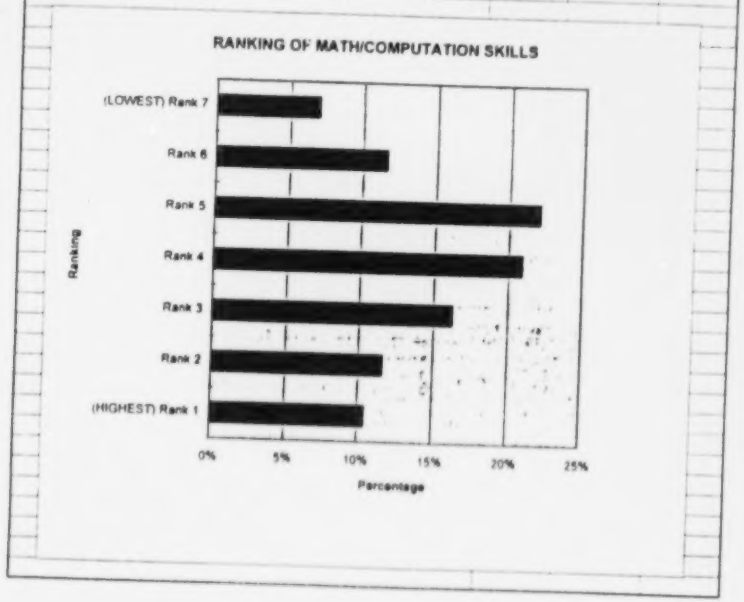
(12a) Math/computation skills		
	Percent	Frequency
(HIGHEST) Rank 1	10%	9
Rank 2	12%	10
Rank 3	16%	14
Rank 4	21%	18
Rank 5	22%	19
Rank 6	12%	10
(LOWEST) Rank 7	7%	6
	100%	86



12. BASIC SKILLS/QUALIFICATIONS & RANKING	Highest Priority		Lowest Priority		Average Ranking	
	Percent	Ranking	Percent	Ranking	Percent	Ranking
Math/computation skills	10	4	7	5	3.95	4
Interpersonal skills	53	1	2		1.99	1
Computer expertise	8	5	6	4	4.17	5
Problem-solving skills	26	2	2		2.6	2
Ability to make presentations	1	7	66	7	6.27	7
Writing skills	6	6	11	6	4.68	6
Critical thinking skills	13	3	2		3.34	3

13. TECHNICAL/WORKPLACE QUALIFICATIONS & RANKING	Highest Priority		Lowest Priority		Average Ranking	
	Percent	Ranking	Percent	Ranking	Percent	Ranking
(a) Education in the appropriate field	24	2	6	4	3.73	3
(b) Technical expertise	32	1	2	2	3.07	1
(c) Job-related experience	21	3	11	6	3.92	4
(d) Leadership qualities	7	8	46	8	5.87	8
(e) Ability to follow directions	11	6	10	5	4.85	6
(f) Positive work attitude	18	4	0	1	3.46	12
(g) Good work habits	13	5	4	3	3.96	5
(h) Adaptability	10	7	13	7	5.07	7

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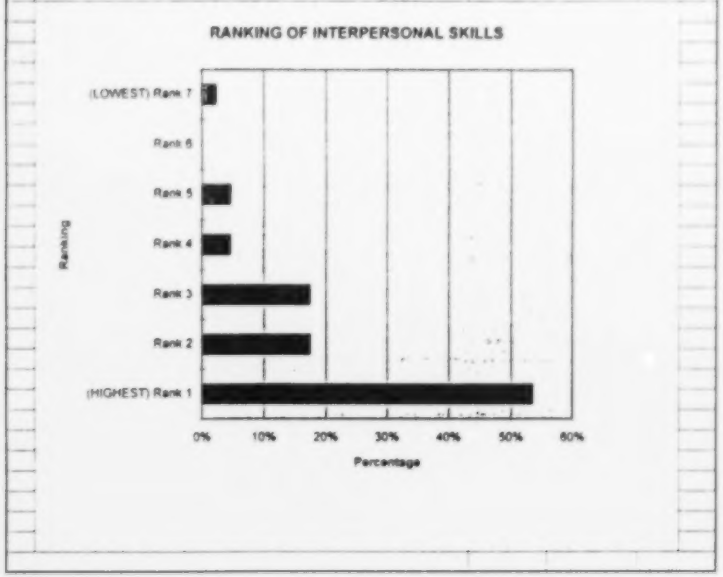
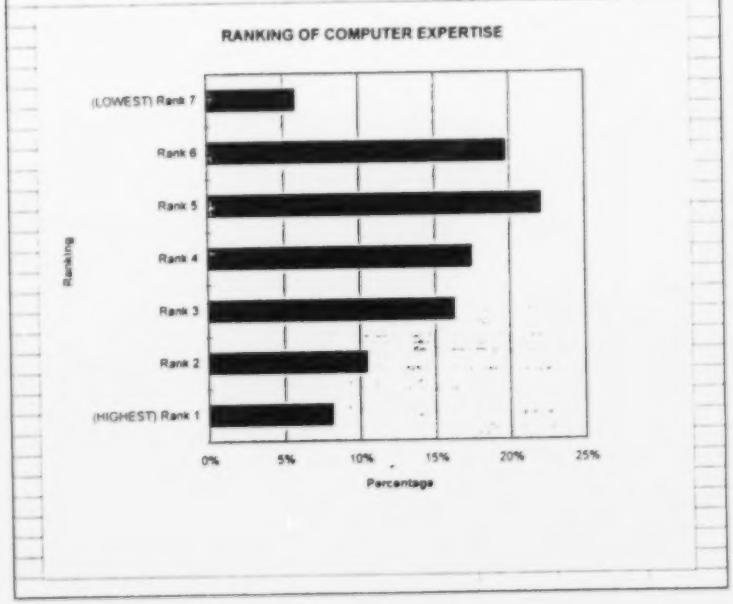
(12b) Interpersonal skills	Percent	Frequency
(HIGHEST) Rank 1	53%	46
Rank 2	17%	15
Rank 3	17%	15
Rank 4	5%	4
Rank 5	5%	4
Rank 6	0%	0
(LOWEST) Rank 7	2%	2
	100%	86



(12c) Computer expertise	Percent	Frequency
(HIGHEST) Rank 1	8%	7
Rank 2	10%	9
Rank 3	16%	14
Rank 4	17%	15
Rank 5	22%	19
Rank 6	20%	17
(LOWEST) Rank 7	6%	5
	100%	86



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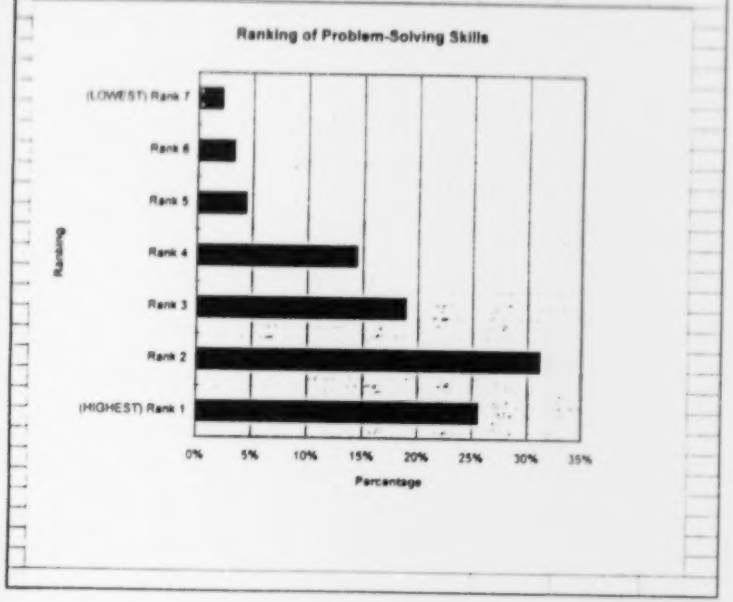
(12d) Problem-solving skills	Percent	Frequency
(HIGHEST) Rank 1	26%	23
Rank 2	31%	28
Rank 3	19%	17
Rank 4	14%	13
Rank 5	4%	4
Rank 6	3%	3
(LOWEST) Rank 7	2%	2
	100%	90



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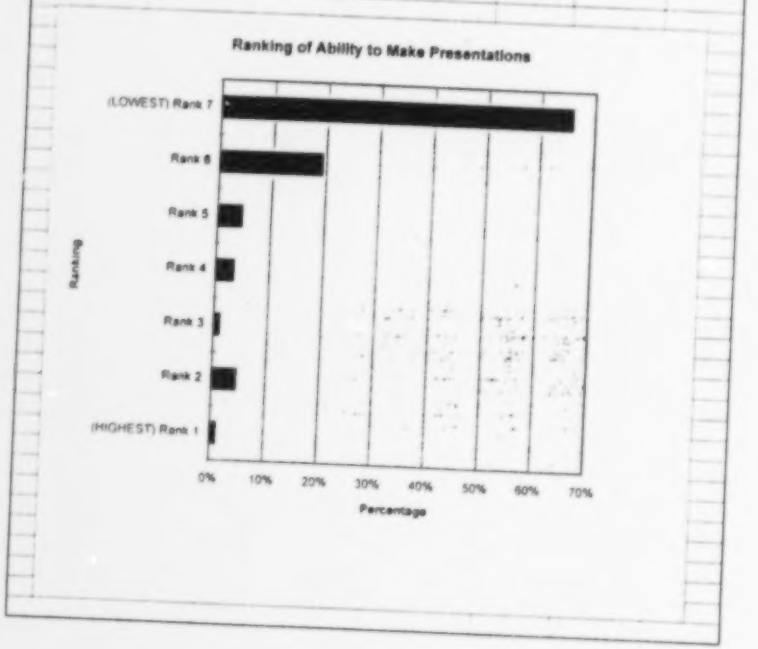
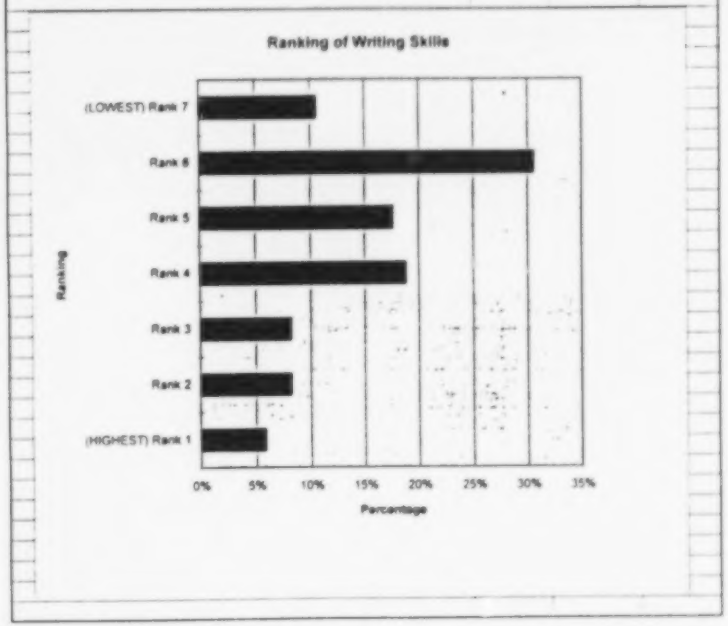
(12e) Ability to make Presentations	Percent	Frequency
(HIGHEST) Rank 1	1%	1
Rank 2	5%	4
Rank 3	1%	1
Rank 4	3%	3
Rank 5	5%	4
Rank 6	19%	17
(LOWEST) Rank 7	66%	58
	100%	88



(12f) Writing Skills	Percent	Frequency
(HIGHEST) Rank 1	6%	5
Rank 2	8%	7
Rank 3	8%	7
Rank 4	19%	16
Rank 5	18%	15
Rank 6	31%	26
(LOWEST) Rank 7	11%	9
	100%	85



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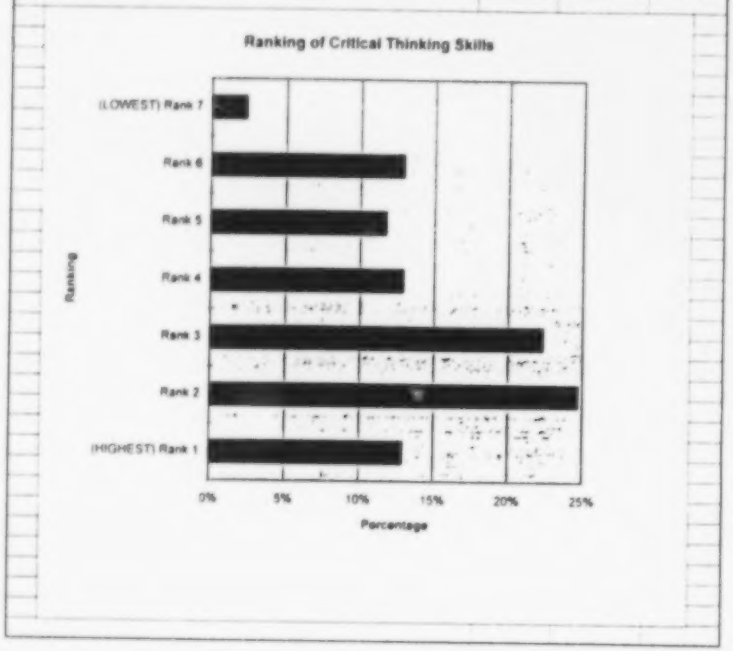
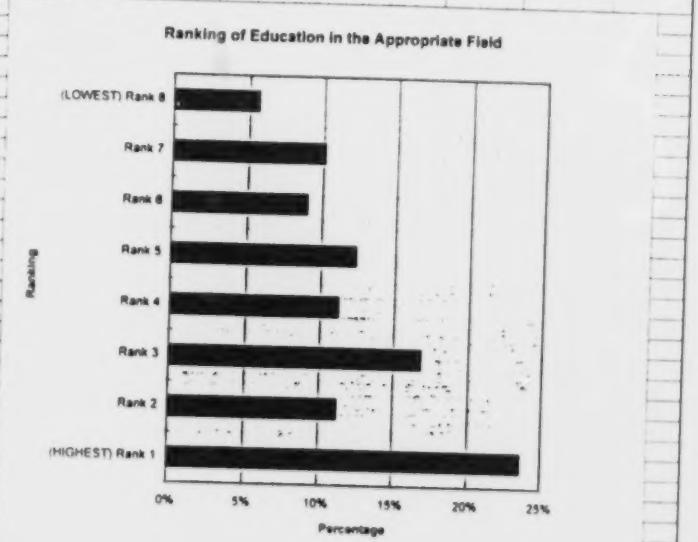
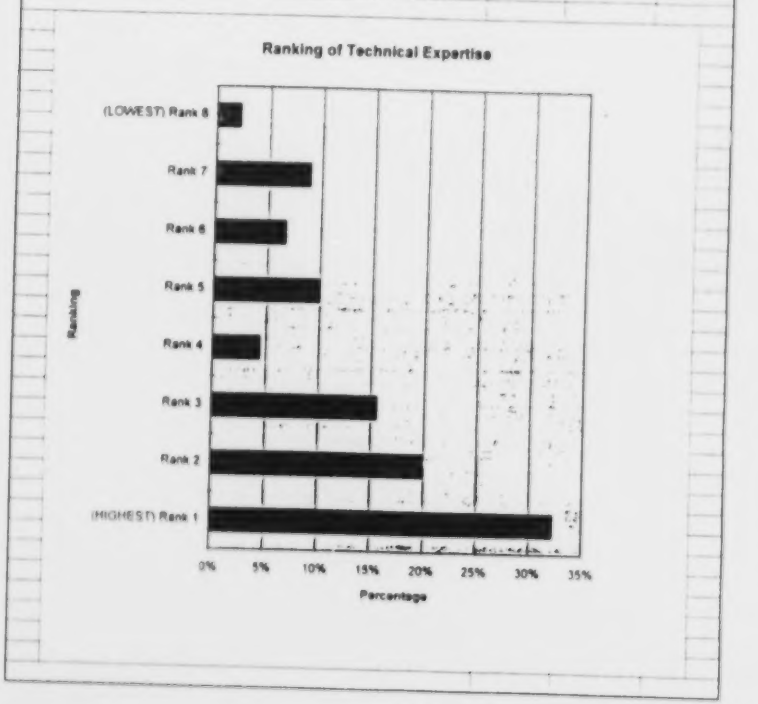
(12g) Critical thinking skills	Percent	Frequency
(HIGHEST) Rank 1	13%	11
Rank 2	25%	21
Rank 3	22%	19
Rank 4	13%	11
Rank 5	12%	10
Rank 6	13%	11
(LOWEST) Rank 7	2%	2
	100%	85



(13a) Education in the appropriate field		
	Percent	Frequency
(HIGHEST) Rank 1	24%	21
Rank 2	11%	10
Rank 3	17%	15
Rank 4	11%	10
Rank 5	12%	11
Rank 6	9%	8
Rank 7	10%	9
(LOWEST) Rank 8	6%	5
	100%	89



(13b) Technical expertise		
	Percent	Frequency
(HIGHEST) Rank 1	32%	29
Rank 2	20%	18
Rank 3	16%	14
Rank 4	4%	4
Rank 5	10%	9
Rank 6	7%	6
Rank 7	9%	8
(LOWEST) Rank 8	2%	2
	100%	90



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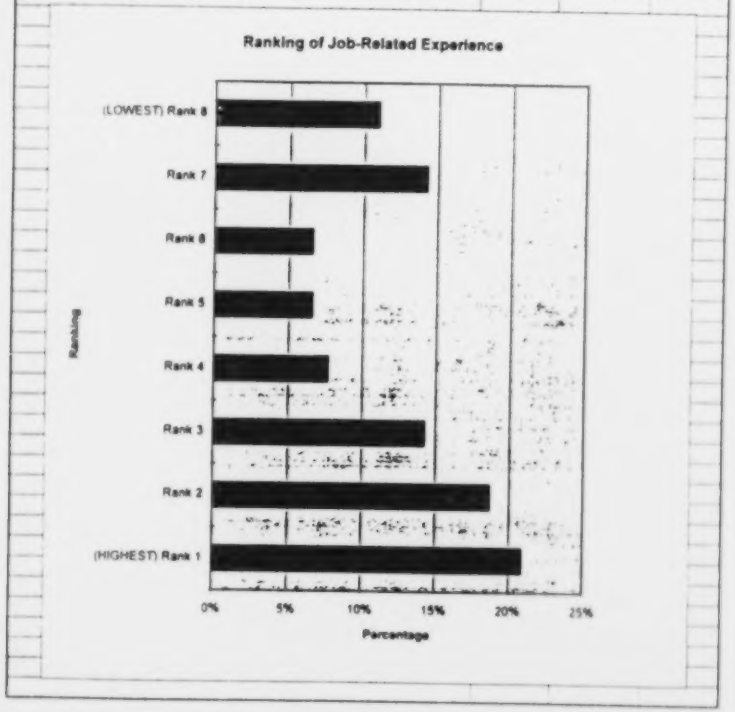
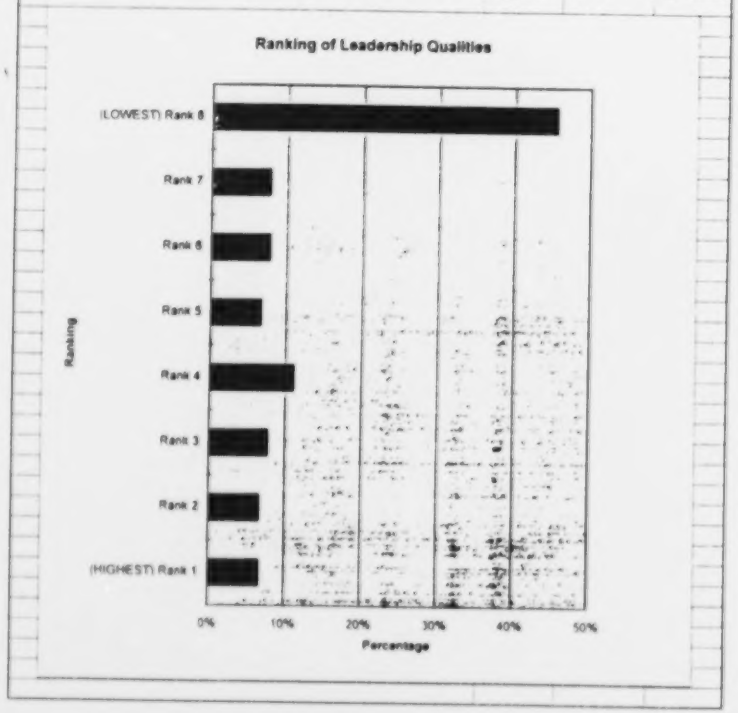
(13c) Job-Related Experience	Percent	Frequency
(HIGHEST) Rank 1	21%	19
Rank 2	19%	17
Rank 3	14%	13
Rank 4	8%	7
Rank 5	7%	6
Rank 6	7%	6
Rank 7	14%	13
(LOWEST) Rank 8	11%	10
	100%	91



(13d) Leadership Qualities	Percent	Frequency
(HIGHEST) Rank 1	7%	6
Rank 2	7%	6
Rank 3	8%	7
Rank 4	11%	10
Rank 5	7%	6
Rank 6	8%	7
Rank 7	8%	7
(LOWEST) Rank 8	46%	41
	100%	90



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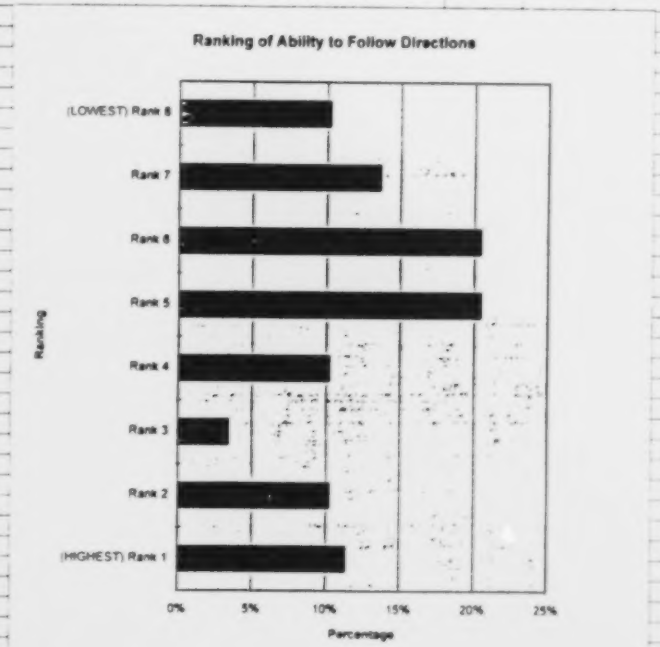
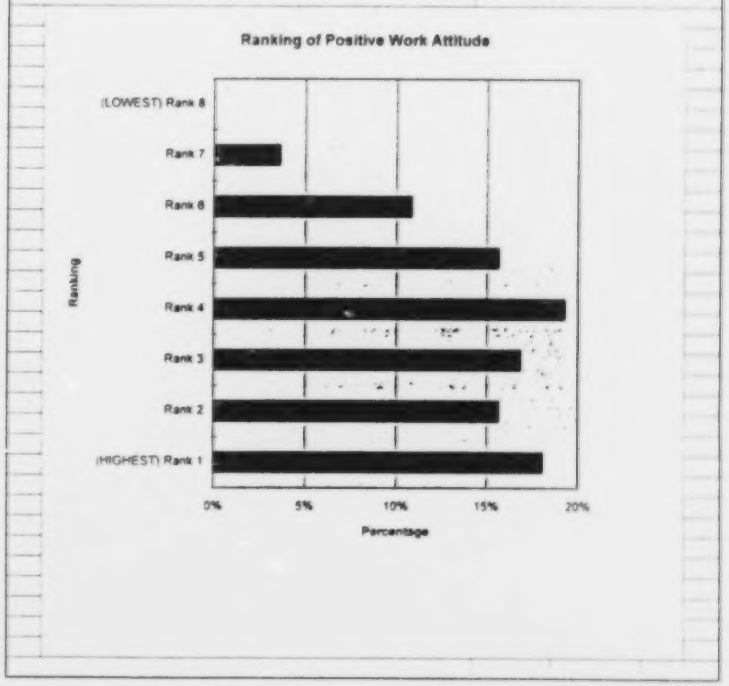
(13e) Ability to follow directions		
	Percent	Frequency
(HIGHEST) Rank 1	11%	10
Rank 2	10%	9
Rank 3	3%	3
Rank 4	10%	9
Rank 5	20%	18
Rank 6	20%	18
Rank 7	14%	12
(LOWEST) Rank 8	10%	9
	100%	88



(13f) Positive work attitude		
	Percent	Frequency
(HIGHEST) Rank 1	18%	15
Rank 2	16%	13
Rank 3	17%	14
Rank 4	19%	16
Rank 5	16%	13
Rank 6	11%	9
Rank 7	4%	3
(LOWEST) Rank 8	0%	0
	100%	83



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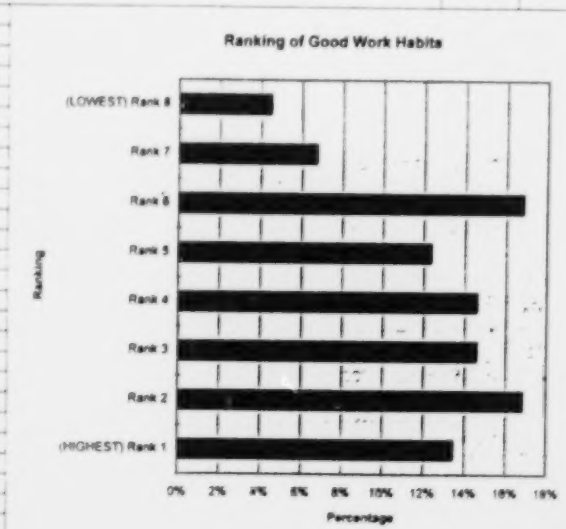
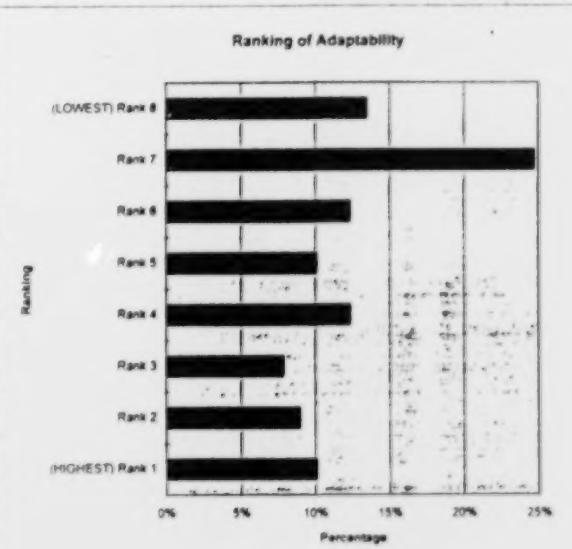
(13g) Good work habits	Percent	Frequency
(HIGHEST) Rank 1	13%	12
Rank 2	17%	15
Rank 3	15%	13
Rank 4	15%	13
Rank 5	12%	11
Rank 6	17%	15
Rank 7	7%	6
(LOWEST) Rank 8	4%	4
	100%	89



(13h) Adaptability	Percent	Frequency
(HIGHEST) Rank 1	10%	9
Rank 2	9%	8
Rank 3	8%	7
Rank 4	12%	11
Rank 5	10%	9
Rank 6	12%	11
Rank 7	25%	22
(LOWEST) Rank 8	13%	12
	100%	89



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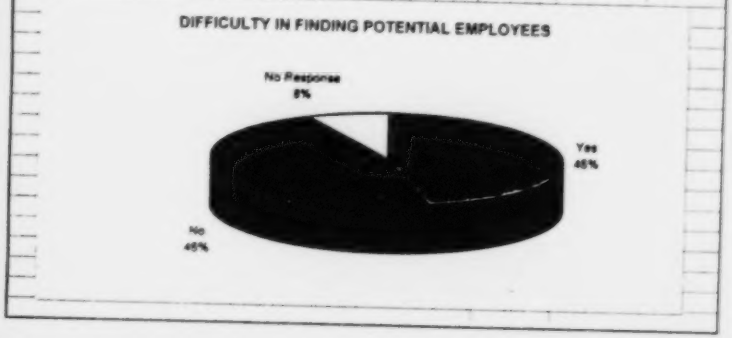
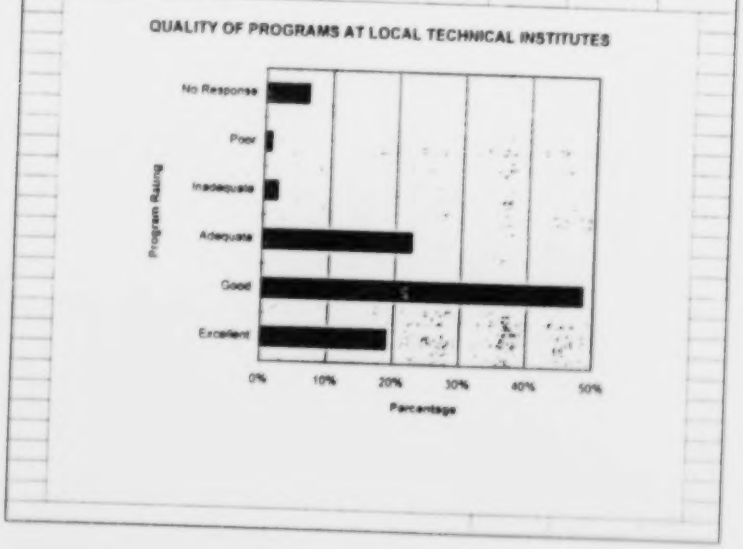
15.a. Are you experiencing difficulties or shortages in finding potential employees in any job area?

EXPERIENCE IN FINDING EMPLOYEES	Percent	Frequency
Yes	46%	43
No	46%	43
No Response	8%	7
	100%	93



14. Based on your answers to questions #12 and 13, and your experience in hiring students or graduates from local technical institutes, how would you rate the quality of the programs of study at your local technical institutes?

QUALITY OF PROGRAM RATING	Percent	Frequency
Excellent	19%	18
Good	48%	45
Adequate	23%	21
Inadequate	2%	2
Poor	1%	1
No Response	6%	6
	100%	93



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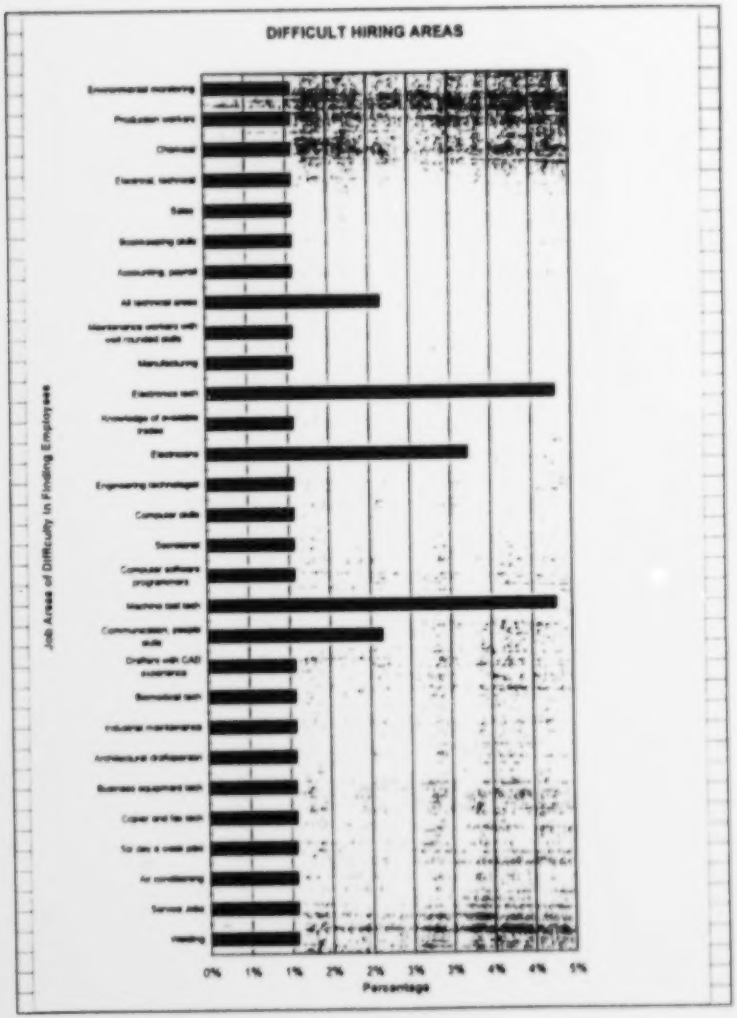
15.b. If you answered yes, in what job areas are you having difficulty hiring?

DIFFICULT HIRING AREAS	Percent	Frequency
Welding	1%	1
Service Jobs	1%	1
Air conditioning	1%	1
Six day a week jobs	1%	1
Copier and fax tech	1%	1
Business equipment tech	1%	1
Architectural draftsperson	1%	1
Industrial maintainance	1%	1
Biomedical tech	1%	1
Drafters with CAD experience	1%	1
Communication, people skills	2%	2
Machine tool tech	4%	4
Computer software programmers	1%	1
Secretarial	1%	1
Computer skills	1%	1
Engineering technologist	1%	1
Electricians	3%	3
Knowledge of available trades	1%	1
Electronics tech	4%	4
Manufacturing	1%	1
Maintenance workers with well rounded skills	1%	1
All technical areas	2%	2
Accounting, payroll	1%	1
Bookkeeping skills	1%	1
Sales	1%	1
Electrical, technical	1%	1
Chemical	1%	1
Production workers	1%	1
Environmental monitoring	1%	1



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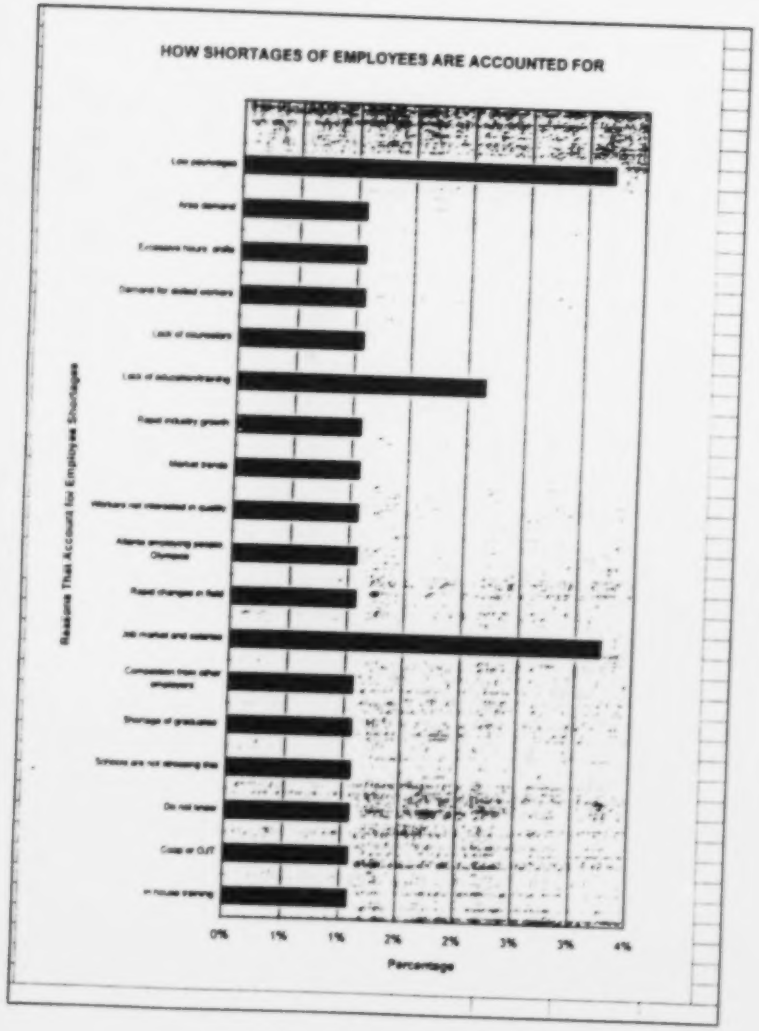

15 c. How do you account for this/these shortages?

HOW SHORTAGE IS ACCOUNTED FOR	Percent	Frequency
In house training	1%	1
Coop or OJT	1%	1
Do not know	1%	1
Schools are not stressing this	1%	1
Shortage of graduates	1%	1
Competition from other employers	1%	1
Job market and salaries	3%	3
Rapid changes in field	1%	1
Atlanta employing people, Olympics	1%	1
Workers not interested in quality	1%	1
Market trends	1%	1
Rapid industry growth	1%	1
Lack of education/training	2%	2
Lack of counselors	1%	1
Demand for skilled workers	1%	1
Excessive hours, shifts	1%	1
Area demand	1%	1
Low pay/wages	3%	3

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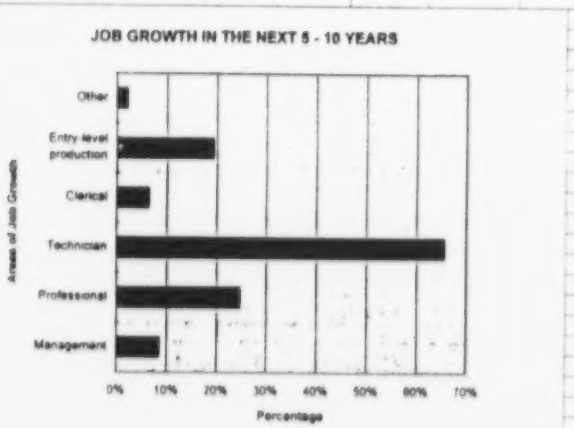
16.a. As you look ahead to the next 5 - 10 years, where do you think most of the job growth will occur in your company?

JOB GROWTH IN THE NEXT 5-10 YEARS	Percent	Frequency
Management	9%	8
Professional	25%	23
Technician	66%	61
Clerical	6%	6
Entry-level production	19%	18
Other	2%	2



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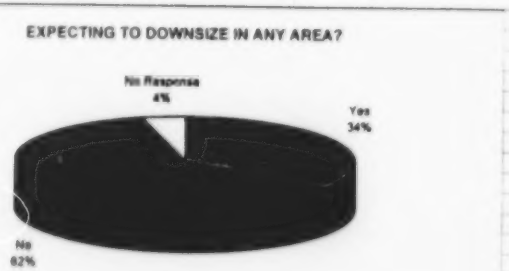
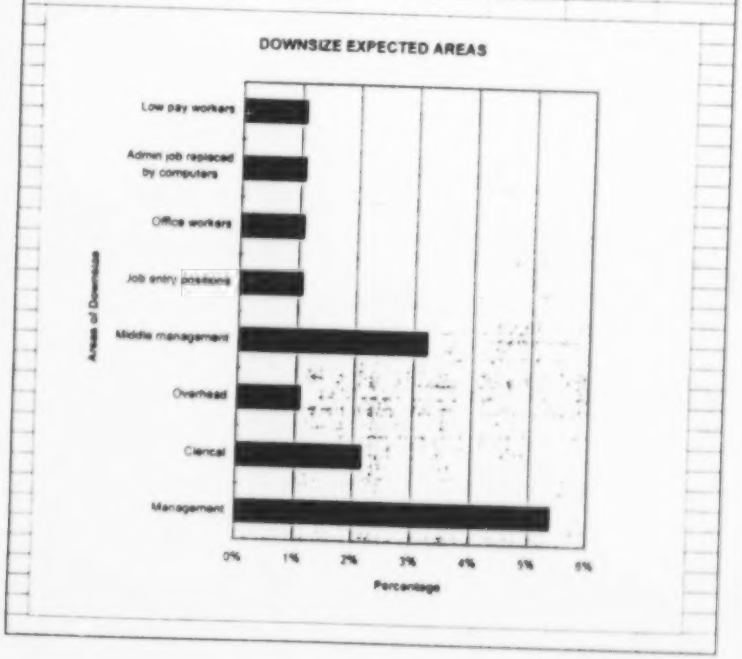
16.b. Do you expect to downsize in any area?

DOWNSIZE EXPECTATION	Percent	Frequency
Yes	34%	32
No	61%	57
No Response	4%	4
	100%	93



16 c. If you answered "yes," in what area(s) do you expect to downsize?

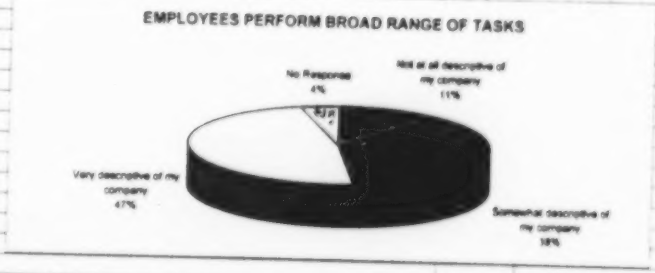
AREAS EXPECTED TO DOWNSIZE	Percent	Frequency
Management	5%	5
Clerical	2%	2
Overhead	1%	1
Middle management	3%	3
Job entry positions	1%	1
Office workers	1%	1
Admin job replaced by computers	1%	1
Low pay workers	1%	1



WORKFORCE TRENDS

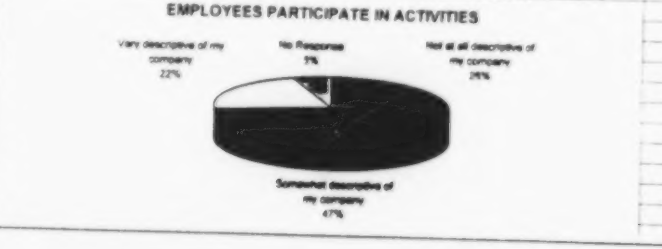
17. Employees perform a broad range of tasks including operating and maintaining their own equipment and performing their own quality control

	Percent	Frequency
Not at all descriptive of my company	11%	10
Somewhat descriptive of my company	38%	35
Very descriptive of my company	47%	44
No Response	4%	4
	100%	93



18. Employees participate in activities such as goal setting and budgeting formerly reserved for management.

	Percent	Frequency
Not at all descriptive of my company	26%	24
Somewhat descriptive of my company	47%	44
Very descriptive of my company	22%	20
No Response	5%	5
	100%	93



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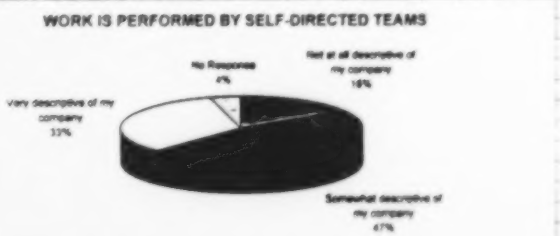
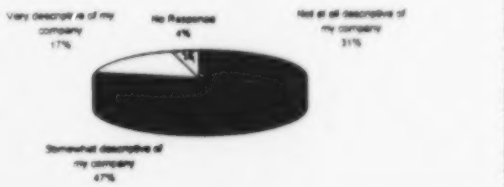
19. Work is increasingly performed by self-directed teams where problem solving and decision making are important parts of the job

	Percent	Frequency
Not at all descriptive of my company	16%	15
Somewhat descriptive of my company	46%	43
Very descriptive of my company	33%	31
No Response	4%	4
	100%	93


WORK IS PERFORMED BY SELF-DIRECTED TEAMS
No Response 4%
Not at all descriptive of my company 16%
Very descriptive of my company 33%
Somewhat descriptive of my company 47%

20. Collaboration among autonomous teams of workers has replaced chain-of-command management structures

	Percent	Frequency
Not at all descriptive of my company	31%	29
Somewhat descriptive of my company	47%	44
Very descriptive of my company	17%	16
No Response	4%	4
	100%	93


COLLABORATION AMONG (AUTONOMOUS) WORKER TEAMS
Very descriptive of my company 17%
No Response 4%
Not at all descriptive of my company 31%
Somewhat descriptive of my company 47%

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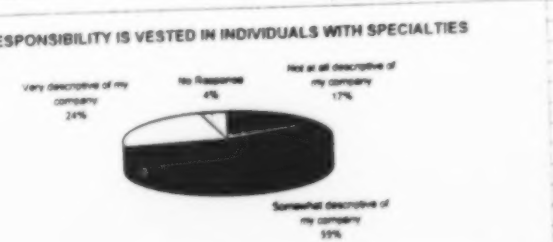
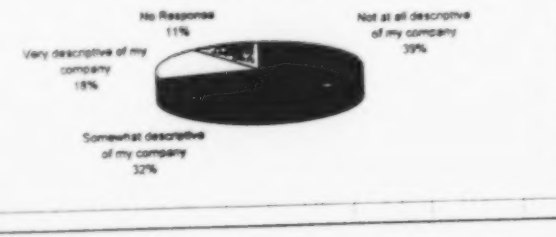
21. Responsibility is increasingly vested in individuals with specialties, not in positions (vertical vs. horizontal structures)

	Percent	Frequency
Not at all descriptive of my company	17%	16
Somewhat descriptive of my company	55%	51
Very descriptive of my company	24%	22
No Response	4%	4
	100%	93


RESPONSIBILITY IS VESTED IN INDIVIDUALS WITH SPECIALTIES
Very descriptive of my company 24%
No Response 4%
Not at all descriptive of my company 17%
Somewhat descriptive of my company 55%

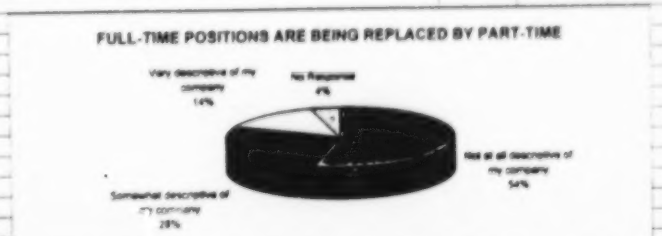
22. Mass production is being replaced with customized manufacturing

	Percent	Frequency
Not at all descriptive of my company	39%	36
Somewhat descriptive of my company	32%	30
Very descriptive of my company	18%	17
No Response	11%	10
	100%	93


MASS PRODUCTION IS BEING REPLACED WITH CUSTOMIZED MANUFACTURING
No Response 11%
Not at all descriptive of my company 39%
Very descriptive of my company 18%
Somewhat descriptive of my company 32%

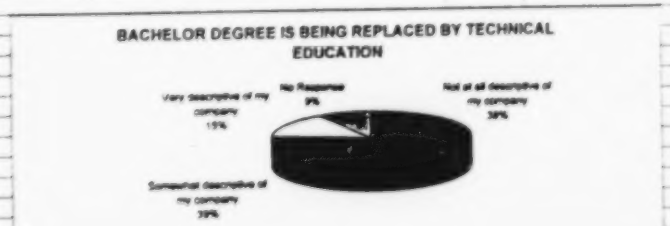
23 Full-time positions are being replaced by part-time and temporary employees.

	Percent	Frequency
Not at all descriptive of my company	54%	50
Somewhat descriptive of my company	28%	28
Very descriptive of my company	14%	13
No Response	4%	4
	100%	93


FULL-TIME POSITIONS ARE BEING REPLACED BY PART-TIME
Very descriptive of my company 14%
No Response 4%
Not at all descriptive of my company 54%
Somewhat descriptive of my company 28%

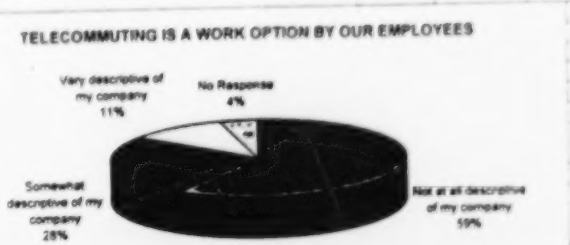
24 Emphasis on bachelor degree college education is being replaced by an emphasis on technical training and associate degree/diplomas in technical fields

	Percent	Frequency
Not at all descriptive of my company	38%	35
Somewhat descriptive of my company	39%	36
Very descriptive of my company	15%	14
No Response	9%	8
	100%	93


BACHELOR DEGREE IS BEING REPLACED BY TECHNICAL EDUCATION
Very descriptive of my company 15%
No Response 9%
Not at all descriptive of my company 38%
Somewhat descriptive of my company 39%

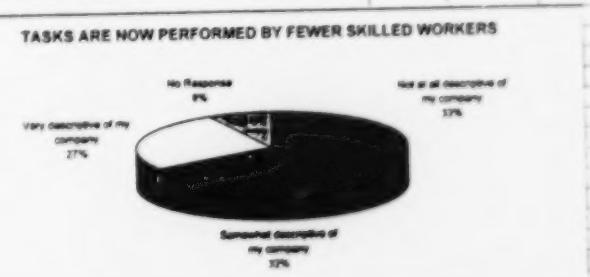
25 Telecommuting is a work option used by some of our employees.

	Percent	Frequency
Not at all descriptive of my company	59%	55
Somewhat descriptive of my company	26%	24
Very descriptive of my company	11%	10
No Response	4%	4
	100%	93


TELECOMMUTING IS A WORK OPTION BY OUR EMPLOYEES
Very descriptive of my company 11%
No Response 4%
Somewhat descriptive of my company 26%
Not at all descriptive of my company 59%

26 Tasks formerly performed by many unskilled workers now are performed by fewer highly skilled workers.

	Percent	Frequency
Not at all descriptive of my company	33%	31
Somewhat descriptive of my company	32%	30
Very descriptive of my company	27%	25
No Response	8%	7
	100%	93


TASKS ARE NOW PERFORMED BY FEWER SKILLED WORKERS
No Response 8%
Not at all descriptive of my company 33%
Very descriptive of my company 27%
Somewhat descriptive of my company 32%

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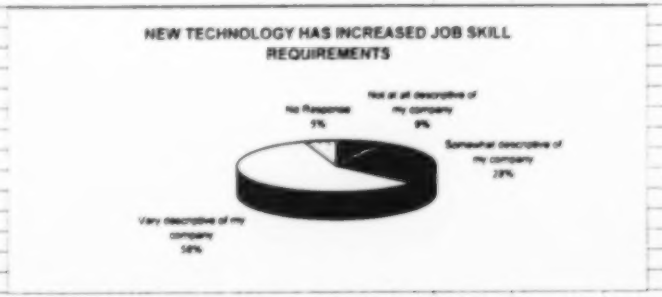
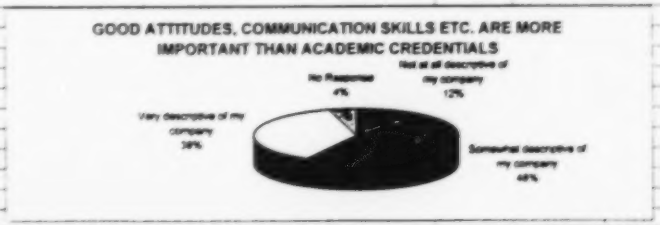
27. The introduction of new technology has increased job skill requirements for many workers.

	Percent	Frequency
Not at all descriptive of my company	9%	8
Somewhat descriptive of my company	28%	26
Very descriptive of my company	58%	54
No Response	5%	5
	100%	93


NEW TECHNOLOGY HAS INCREASED JOB SKILL REQUIREMENTS
No Response 5%
Not at all descriptive of my company 9%
Somewhat descriptive of my company 28%
Very descriptive of my company 58%

28. Good attitudes, communication skills, and previous successful work history are more important than academic credentials (beyond minimum requirements).

	Percent	Frequency
Not at all descriptive of my company	12%	11
Somewhat descriptive of my company	46%	43
Very descriptive of my company	38%	35
No Response	4%	4
	100%	93


GOOD ATTITUDES, COMMUNICATION SKILLS ETC. ARE MORE IMPORTANT THAN ACADEMIC CREDENTIALS
No Response 4%
Not at all descriptive of my company 12%
Very descriptive of my company 38%
Somewhat descriptive of my company 46%

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